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Covert, Timon

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## ABSTRACT

Synthesizing the results of many studies (prior to 1928) regarding academic achievement in one-teacher and larger rural schools as measured by standardized tests, this U.S. Office of Education bulletin presents comparative statistics for reading, arithmetic, spelling, and handwriting. Specifically, this bulletin includes data (taken from the largest type of rural school included in the survey reports reviewed and compared with one-teacher schools in these reports) re: reading scores of pupils in rural schools of 20 states and of Logan County, Ohio (rate scores by grades in both consolidated and 1-teacher schools); reading abilities of Indiana pupils in terms of grade standards; median reading scores of Arizona pupils; reading abilities of pupils in 6 different states and arithmetic abilities in the same 6 states (Kansas, Kentucky, New York, Oklahoma, Texas, and Virginia); arithmetic scores for St. Albans Township, Licking County, Ohio; median spelling scores in 5 states (Ashbaugh-Scale and Buckingham's Extension of Ayers Scale); median spelling scores in Wisconsin; spelling scores in Spokane County, Washington; median handwriting scores in 4 states; comparisons of teaching results in certain content and other subjects (history, geography, composition, and English). Generally, the results presented here indicate that students in larger rural schools achieve better academically than those trained in one-teacher schools. (JC)

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DEPARTMENT OF THE INTERIOR  
BUREAU OF EDUCATION

BULLETIN, PART NO. 15

EDUCATIONAL ACHIEVEMENTS  
OF ONE-TEACHER AND OF LARGER  
RURAL SCHOOLS

TIMON COVERT

REPRESENTATIVE IN RURAL EDUCATION  
BUREAU OF EDUCATION



EDUCATIONAL ACHIEVEMENTS  
ONE-TEACHER AND LARGER  
RURAL SCHOOLS

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## LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,  
BUREAU OF EDUCATION,

Washington, D. C., July 5, 1928.

Surely the desire of rural-school patrons to provide educational opportunities for their children equal to the best has resulted in a remarkable program of rural-school consolidation throughout the United States during the past two decades. To determine whether the change from a small to a larger school organization in rural territory results in greater educational efficiency, a large number of reliable studies have been made; but no comprehensive compilation of the results is in print. I therefore asked Mr. Timon Cover, assistant specialist in rural education, to collect, summarize, and interpret these data. I recommend that the study, "Educational Achievements of One-Teacher and of Larger Rural Schools," be published as a bulletin of the Bureau of Education.

Respectfully submitted:

A. J. TIGER,  
*Commissioner.*

The Secretary of the Interior.

## EDUCATIONAL ACHIEVEMENTS OF ONE-TEACHER AND OF LARGER RURAL SCHOOLS

### INTRODUCTION

Nearly one hundred years ago Horace Mann made his vigorous attack upon the one-room schools. Since that time educators have kept up a continual bombardment against them. It has been pointed out that one teacher working alone with all grades and with pupils of all ages can not be expected to accomplish results equal to the results made possible by the specialization of the well-graded school; that one-room schools are taught by the least-trained and youngest teachers; that the percentage of attendance in one-teacher schools is far below that of grade schools; and that the social advantages of centralized schools give them superiority in training for life that small isolated schools can not reach.

The present-day practice of attempting to evaluate scientifically the educational achievements of pupils has centered an interest in the instructional results obtained in one-teacher schools as compared with those obtained in large rural schools. This is done by carefully planned pupil-testing programs combined with certain other checks, such as teachers' marks and age-grade tables.

Before the advent of standardized tests, the task of comparing schools in educational achievement was practically impossible; with age-grade and achievement norms scientifically established, it becomes a simple matter. There are now available the results of many studies in which standardized tests have been employed to show the achievement of pupils in one-teacher and in larger rural schools. This bulletin attempts to bring together a few of the many important findings of these studies; data selected for this purpose typify the results of the respective studies from which such selections were made. Selections of scores, unless otherwise noted, have been made by taking the results reported from the largest type of rural-school organizations included in the various survey reports reviewed, to compare with the results from the one-teacher organizations included in the respective reports. Such selections were made because it is the large type of rural-school organization, i. e., sufficiently large to function economically and efficiently rather than the two or three teacher school, which is recommended as the one to replace small rural schools where feasible.

The main purpose of this bulletin is to bring together results obtained from educational testing programs in the two types of schools.

**APPENDIX B** *Additional names and French equivalents.*

No attempt is made here to prove the contention that the ability of pupils in one type of school to advance is greater than that of those in the other type. In a few instances it has been impossible to present stepped results without including statements relating to the advantages one or the other type of school possesses in producing those intercivic results among citizens trained to take an active part in developing the ideals of social opportunity and justice which is generally conceded to be education's greatest task.

The steadily increasing number of large rural schools. During the past 25 years a widespread sentiment in favor of centralized schools has been created, and these schools are increasing at the approximate rate of 1,000 a year in the United States, while the number of one-teacher schools is decreasing at five times this rate. This constant growth in numbers of large rural schools is due chiefly to the following facts: There are too many teachers for people left, who fail to see the many social and educational advantages of the larger and better equipped school; the great improvement in roads, which has taken place recently; and the modern school bus, which is now equipped with comfortable seats, heater, windows, and front and rear doors.

#### Experiments on the absorption and desorption of chlorine

Table 3 shows that the number of one-teacher schools has decreased from approximately 189,000 in 1920 to approximately 161,000 in 1926, an average annual decrease for the six years of approximately 4,500. The number of consolidated schools increased during the six-year period approximately 6,000, which is an average yearly increase of 1,000. The change in numbers of the two types of rural schools, a decrease on the one hand and an increase on the other, indicates that nearly 30,000 small rural schools have been closed since 1920 and that as a result 6,000 larger rural schools have been established to take their places.

Obviously large rural schools are constantly becoming more significant factors in American rural education. From reports received by the Bureau of Education from typical consolidated schools in the various States it is estimated that approximately 4,500,000 boys and girls attend these schools and 150,000 teachers are employed in them.

**Studies and Tests.** Printed reports of testing programs are usually those of the superintendents, although a number of elaborate reports of county testing programs are available in printed form. Recently the results of educational surveys showing achievement of pupils in different types of schools have begun to make their appearance in the regular reports of state departments of education.

A study directed by a committee of the department of rural education of the National Education Association in 1921-22 to determine the comparative results of instruction in one-teacher and consolidated schools is the most extensive investigation that has been made for the purpose. The report of this study (see Table 2) shows the ages, grade distribution, grade achievement, and age achievement of 19,599 pupils in 135 consolidated schools and of 3,653 in 371 one-teacher schools in 29 different States. Pupils were tested in reading, arithmetic, language, spelling, and handwriting by using the Monroe Standardized Silent Reading Tests, the Woody-McCall Mixed Fundamental of Arithmetic, the Pitme Language Scales, the Iowa Spelling Scales, and the Ayres Handwriting Scale.

Age	Consolidated Schools		One-Teacher Schools	
	Median Age	Per cent of Pupils	Median Age	Per cent of Pupils
3	5.5	100	5.5	100
4	6.5	100	6.5	100
5	7.5	100	7.5	100
6	8.5	100	8.5	100
7	9.5	100	9.5	100
8	10.5	100	10.5	100

Table 2 shows the median ages and per cent of pupils for each of the grades 3 to 8, inclusive, in the 135 consolidated and the 371 one-teacher schools included in the study mentioned. Pupils are grouped approximately the same according to their chronological age and distributed through the grades in approximately the same relative numbers in the two types of rural schools, although the holding power of the consolidated school seems to be a little greater than that of the one-teacher school in the upper grades.

#### READING ABILITIES OF PUPILS IN ONE-TEACHER AND IN LARGER RURAL SCHOOLS

The reading ability of a pupil is of great consequence to him throughout his school career and in adult life; much of his school progress in all subjects is limited by this ability; it is therefore regarded as one of the fundamentals. An examination of the instruc-

#### A. ACHIEVEMENTS OF RURAL SCHOOLS

Actual results in the subject is considered one of the best means of testing opportunity, taught work, and reading scores of pupils have been secured in practically all educational surveys. This section lists forth typical evidence of comparable results obtained from reading examinations of rural pupils in small and in large rural schools.

*Reading scores of pupils in consolidated school of 200 days, and of larger Cuyahoga Valley.* Reading was obtained in the study directed by the committee of the department of rural education of the National Education Association, show about higher median scores (see A, Table 2). In both rate and comprehension were made in each grade of the consolidated schools next to the corresponding grades of the one-teacher schools. The obvious difference in each case appears in the eighth grade. These differences are significant, since the pupils in 136 consolidated schools and in 271 one-teacher schools were tested, provided that the pupils of the two types of schools were of equal intelligence, for there was little difference in the ages of pupils in the two groups, grade for grade. (See Table 2.)

Table 2.—Median reading scores.

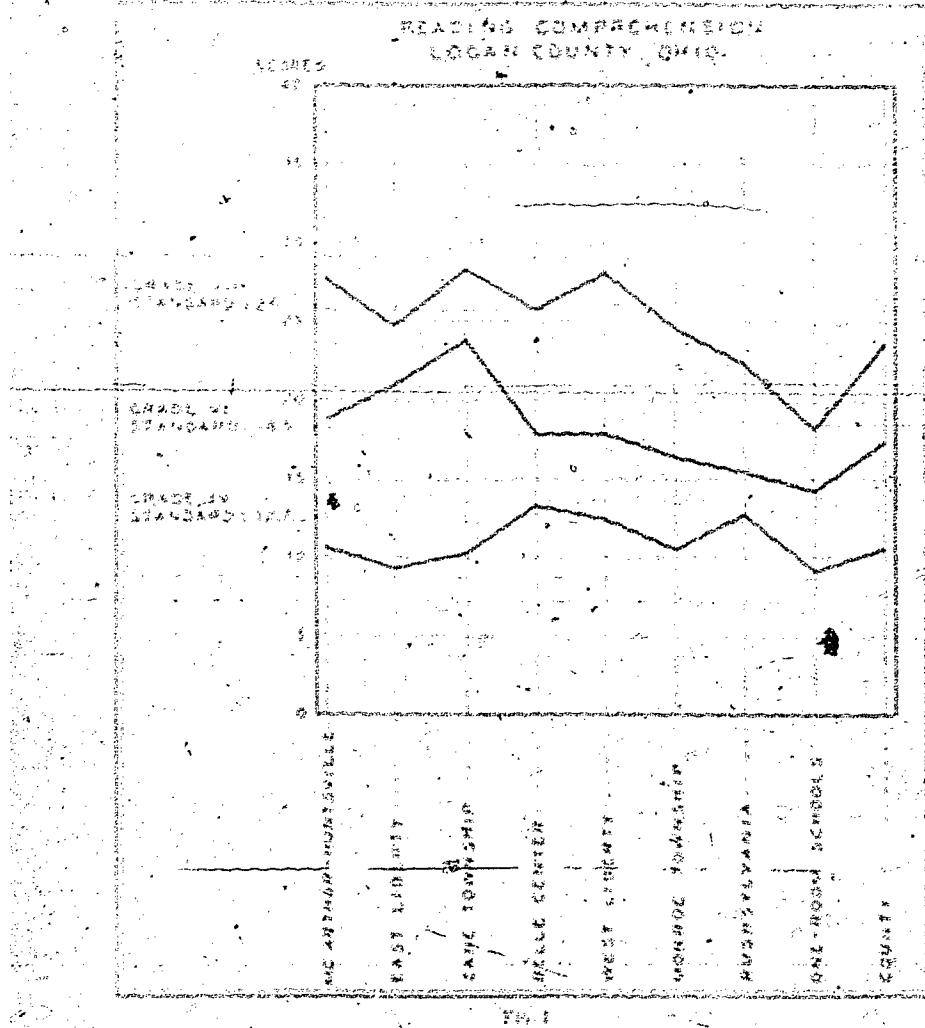
Grade	Consolidated schools		One-teacher schools	
	Rate	Comprehension	Rate	Comprehension
Fourth	100.0	100.0	97.0	97.0
Sixth	100.0	100.0	97.0	97.0
Eighth	100.0	100.0	97.0	97.0

(a) Median reading scores of pupils in consolidated schools and one-teacher schools in Logan County, Ohio, 1921-22, are approximately the same type.

Similar to the results mentioned in the previous paragraph, the report of a survey of the rural schools of Logan County, Ohio, shows higher median reading scores (see B, Table 2) for each grade of the consolidated schools than for the corresponding grades of the one-teacher schools of that county. In this study 3,350 pupils in consolidated schools and 1,058 in one-teacher schools were examined.

Figure 1 shows graphically the median scores in reading comprehension which were made by fourth, sixth, and eighth grade pupils in McCreary, C, Logan County and Belmonteane, Ohio, schools during the year 1921-22.

the county (all the consolidated) and the one-teacher schools in the Logan County, Ohio, survey. Scores for the centralized and consolidated schools, respectively, the same type, are presented separately opposite the school sample, then the scores for all intermediate schools in the county, and the county median. The standard deviation for each



grade is indicated at the left in each case. The graph shows that while there is considerable variation in reading ability among the four schools, in no instance was the median score so low in them as it was for the corresponding grade in the one-teacher schools of the county.

*Reading abilities of Indiana pupils.* The results of reading tests given to rural school pupils in a survey of Indiana schools are shown

the following table showing the average reading scores of the pupils in the different schools.

The pupils of Highland, Lancaster, Newburgh, Orange, and Ulster counties, apparently, had higher reading scores than did pupils in Sullivan and Delaware counties. The question arises, however, whether the table can tell the whole story for the fifth, seventh, and eighth grades. A comparison of the average reading scores for the various schools for each grade, for example, shows that the fifth grade pupils in the Newburgh schools had the highest average reading score, while the pupils in the Sullivan schools had the lowest average reading score.

From the results of the fifth grade reading test, it appears that the pupils in the Sullivan schools had the lowest average reading scores, while the pupils in the Newburgh schools had the highest average reading scores. The pupils in the Orange and Lancaster schools had intermediate average reading scores. The pupils in the Ulster and Highland schools had average reading scores which were intermediate between those of the Sullivan and Newburgh schools.

Median reading scores of eighth grade pupils in every one of the American public schools, fifth and eighth grade pupils in rural schools were tested in the Thorndike-McCall Reading Readiness Test. Median reading scores by pupils in the one teacher schools were fifth and eighth grade, 34.2. The corresponding scores for eighth grade pupils tested in the city schools were 33.9 and 34.2. In the one teacher schools, the median reading scores of eighth grade pupils higher than the eighth grade city pupils, show the same results in their ranks respectively, in the larger part schools of the State. Apparently there was little measurable difference between the attainment of the two groups of pupils in this State in the subject of reading. Comparison between other grades might have shown greater difference, but a comparison in the future may reveal something the opposite, because the great difference made in the one teacher schools, is also true that exceptionally high standards are maintained in the rural schools throughout the State.

Reading abilities of pupils in the different states. Table 1 shows median reading scores made by pupils of metropolitan and of rural schools of each state given in six different areas in present States. In the last column the six states are listed alphabetically.

This table indicates clearly in the matter of the comparative word and the reading ability of the pupils in the different areas of the country. The New York, New England, and Middle Atlantic areas show the highest median reading scores, while the South and West show the lowest.

~~本草綱目~~ 卷之三十一 附錄

the following changes of the characters.

19. *Leucosia* *leucostoma* *leucostoma* *leucostoma* *leucostoma*

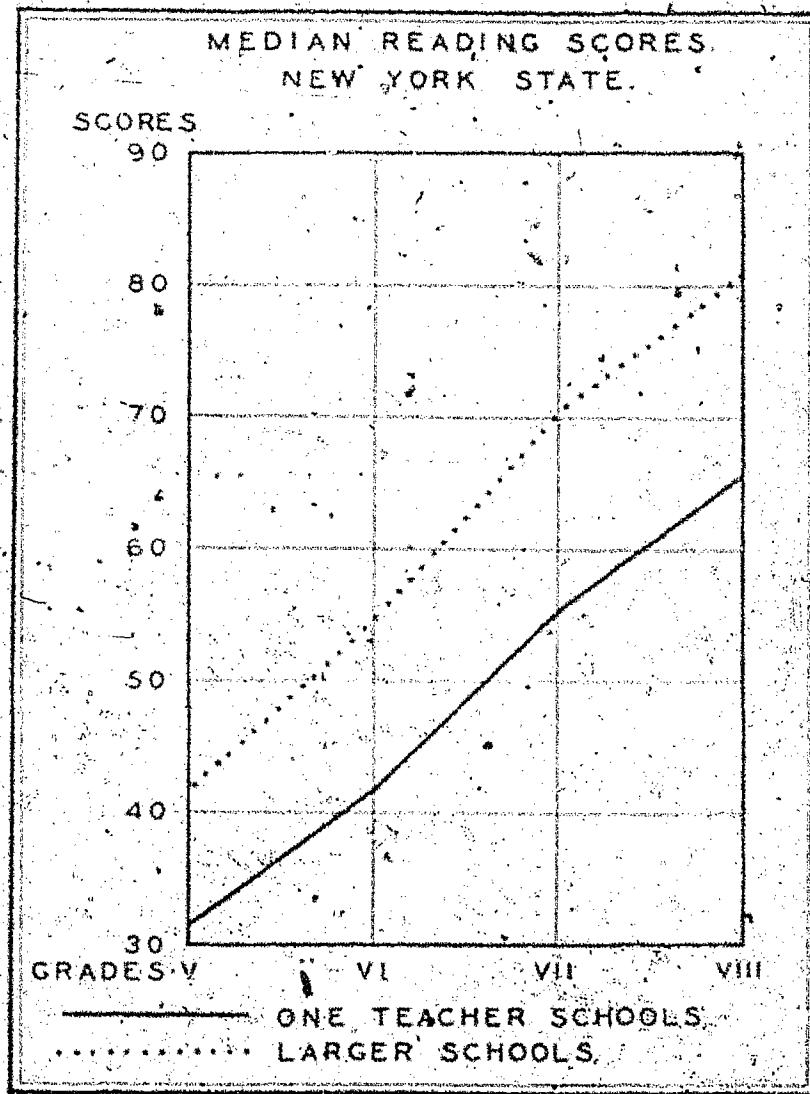
the author of the original document, Augustus Caesar, who was the first to introduce the Julian calendar.

Malibat *conspicua* Druce, No. 1000 made in Fig. 2, however, was taken  
in New Zealand, and taken, I believe, from the same locality as  
that in which the specimen in Fig. 1 was taken.

The following is a list of the principal works of Mr. H. C. Miller, which will be found of interest.

## SIXTH GRADE ACHIEVEMENTS OF RURAL SCHOOLS

There is little apparent difference between comparable reading scores of pupils in the two types of rural schools in Oklahoma, in Texas, or in Virginia. Pupils in the small-type schools of Texas



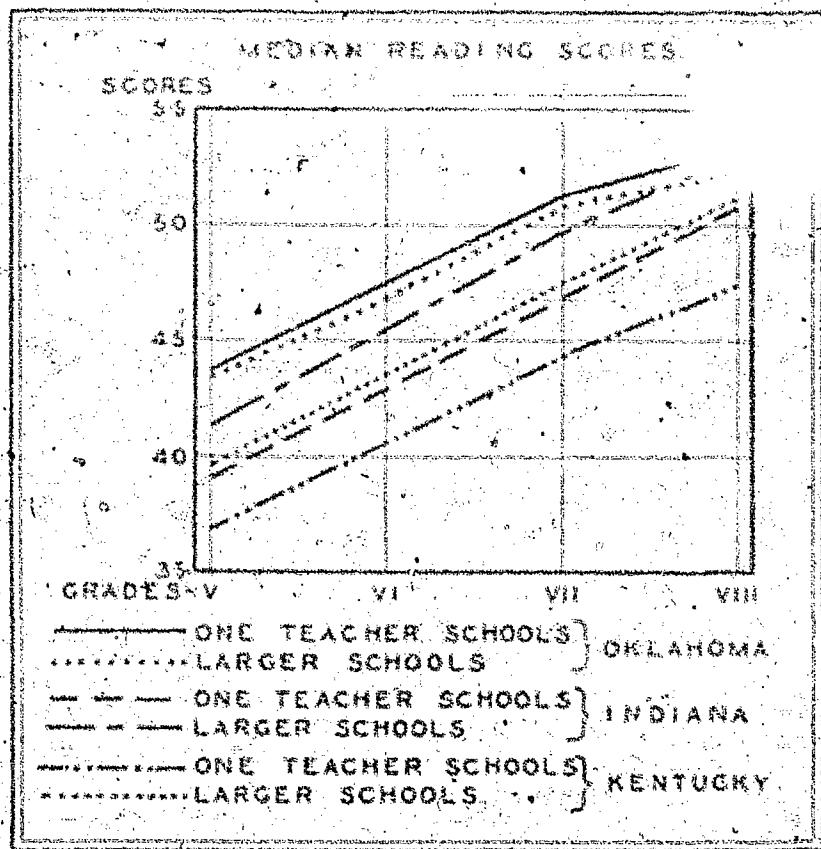
were about two-thirds of a year older chronologically, grade for grade, however, and those in Virginia about one year older than pupils in the large rural schools of the respective States. Considering this may

1936 educational survey report, vol. I. Texas Educational Survey Commission, Austin, Tex., 1936; Virginia Educational Commission, Virginia public schools, Yankees, N. Y., Wright Book Co., 1936.

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9

difference, the pupils in the large rural schools of these States were approximately one year in advance of those of the corresponding grades in the one-teacher schools. In four of the six grades tested in the Oklahoma schools slightly higher attainable scores were made by pupils in the one-teacher schools than by those of the large rural schools.



The median reading scores made in grades 5, 6, 7, and 8 in the two types of schools in the Oklahoma, the Indiana, and the Kentucky surveys are shown in graphic form in Figure 3.

The graph shows that the median score for each grade represented is higher in the one-teacher schools of Oklahoma than for the corresponding grade in the large rural schools of the State, whereas the opposite is shown to be true concerning the comparable reading scores in the two types of schools in both Indiana and Kentucky.

The following tables show the reading ability of pupils in the two types of rural schools as typified by general statement in other surveys than this report. The percentages shown in each case that in the subject of reading pupils in large rural schools made higher scores than those in one-teacher schools. The differences in some States are quite important a full year's work.

### COMPARING ABILITIES OF PUPILS

A comparison of educational surveys reported over a wide field showing the

approximate central tendencies in arithmetic. In general, the arithmetic tendency seems to be that of the medium rural schools, except in one, which is the town schools. The variations of arithmetic achievement here are typical of others which might be observed.

Arithmetic scores of pupils in six different States—Comparative arithmetic scores have been selected from each of the six State Survey reports, from which selections were made to compare median reading scores. These comparisons are set forth in Table 6 and are representative of data of this type available in the large survey reports.

Table 6.—Median arithmetic scores in six States

	1st	2d	3d	4th	5th	6th	7th	8th	9th	10th
Large rural schools	60.0	61.0	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.0
Small rural schools	60.0	61.0	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.0
One-teacher schools	60.0	61.0	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.0
Town schools	60.0	61.0	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.0
State average	60.0	61.0	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.0
Total	60.0	61.0	62.0	63.0	64.0	65.0	66.0	67.0	68.0	69.0

Numbers represent per cent of pupils tested correctly.

Higher median arithmetic scores were made by pupils in the large rural schools than by those in the one-teacher schools on the tests included in Table 6 in every comparison shown, with the following exceptions: Scores of pupils in grades 4, 6, and 8 in the one-teacher schools of Oklahoma are higher than those of the corresponding grades of the large rural schools.

The variation in arithmetic ability, judged by the measures of central tendencies in the table, between comparable groups of pupils in the two types of schools amounts to a year or more of progress in several instances. The median fifth-grade arithmetic score for the large rural schools of Kansas is equal to that of the next higher grade

In the one-teacher schools of the State, students seventh-grade average 65 per cent in the large rural schools of Indiana and New York and third-grade tests, that which would score for pupils of Virginia, are higher than the corresponding tests for the next higher grades in the one-teacher schools of the respective States; and the median fifth-grade score in the large rural schools of Kentucky is higher than that of the seventh-grade in the one-teacher schools.

Arithmetic capacity shown by rural pupils of Licking County, Ohio.—  
There seem brighter pupils, 12 in the three 1-teacher schools and

22 in the non consolidated schools of St. Albans Township, Licking County, Ohio, were tested in the Comptia and Illinois arithmetic examinations to measure their achievement and ability in this subject. The results given in Table 7 show that the more intelligent quotient, the greater was the achievement quotient, and the condition varies in the four fundamental subjects in which the pupils in each of the two types of schools. The achievement quotient used in each case is given in the column last.

Subject	Pupils in 1-Teacher Schools		Pupils in Non-Consolidated Schools	
	Median Intelligence Quotient	Achievement Quotient	Median Intelligence Quotient	Achievement Quotient
Arithmetical Reasoning	100	100	100	100
Arithmetical Problems	100	100	100	100
Arithmetical Computations	100	100	100	100
Arithmetical Applications	100	100	100	100

Pupils in the consolidated school were from 50 to 300 per cent more intelligent in the fundamentals of arithmetic than those of the one-teacher schools. The fact that the intelligence ratings of these pupils had been determined made it possible to establish their accomplishment quotients. In doing this a second arithmetic examination was used, and it was found, as the table shows, that the pupils of the large school did much better work according to their capacity than those of the one-teacher schools.

Results of arithmetic tests in the small study mentioned and in most cases in the larger surveys indicate that pupils in large rural schools master the fundamentals of arithmetic and can solve reasoning problems in this subject, grade for grade, decidedly better than those in one-teacher schools.

The following statements concerning test results on arithmetic are quoted from two survey studies:

As measured by the Stanford Revisioning Tests it is plainly evident that the pupils in the great schools score what appears to be the highest of the entire country. The scores of consolidated schools are as follows: 1915-16 consolidated and 1916-17 consolidated schools, 1916-17 rural schools, 1916-17 large schools.

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efficiency according to their pupils' achievement or pupils' ability to reason on problems in arithmetic.

The spelling scores are uniformly lower for children than the large schools, although the difference for grade 5 is slight.<sup>1</sup> There is not a single age group for which the achievement differences are less than three-tenths of a grade above those of all the larger schools.<sup>2</sup>

SPELLING ABILITIES OF PUPILS

Table 8 presents the median spelling scores of pupils in large and in small rural schools in grades 5, 7, and 8 in Indiana, Kentucky, Oklahoma, and West Virginia, and for grades 5 and 7 in North Carolina.

TABLE 8.—Median spelling scores in five States

State	Grade	Comparable teacher and larger rural schools by grade			
		VII	VIII	Total	Larger
Indiana	5	51.8	52.3	51.8	52.3
Kentucky	5	51.1	51.6	51.1	51.6
Oklahoma	5	50.9	52.6	50.9	52.6
West Virginia	5	51.8	52.3	51.8	52.3
North Carolina	7	51.8	52.0	51.8	52.0
North Carolina	5	51.8	52.0	51.8	52.0

Table 8 shows that higher median scores were made by fifth-grade pupils in the largest-type schools than in the one-teacher schools in Indiana, Kentucky, and North Carolina; lower ones in Oklahoma and West Virginia. Higher comparable scores were made by seventh-grade pupils in the large rural schools than in the one-teacher schools in Indiana and Kentucky; lower ones in North Carolina, Oklahoma, and West Virginia. Higher scores were made in large than in one-teacher schools at the eighth grade in Indiana, Kentucky, and Oklahoma; lower scores in West Virginia.

*Spelling scores in rural schools in three States.*—Figure 4 shows graphically the results of spelling tests in one-teacher and large rural schools in Indiana, Kentucky, and Oklahoma. Median scores are represented for grades 5, 7, and 8 of Indiana and Kentucky schools, and for grades 5, 6, 7, and 8 of Oklahoma schools. In 8 of the 10 comparisons, higher median scores, and in 2, lower ones were made by pupils in the large rural schools than by those of the one-teacher schools. Pupils in the fifth and the seventh grades of the one-teacher schools in Oklahoma made higher median scores than those of the corresponding grades in the large rural schools.

*Comparable spelling scores in Wisconsin rural schools.*—Median scores in standardized spelling tests in one-teacher and larger rural

<sup>1</sup> The results of instruction in different types of elementary schools in Kansas. *Planning, Kans.*, K. S. U. C., March, 1923, 22, 31-33.

<sup>2</sup> Bureau of Education, *Biennial Survey of New York State, Educational Achievement*, Albany, N. Y., 1922, p. 10.

schools in Wisconsin, as given in the biennial report of the State superintendent of public schools, for 1924-1926, are given in comparative form in Table 9.

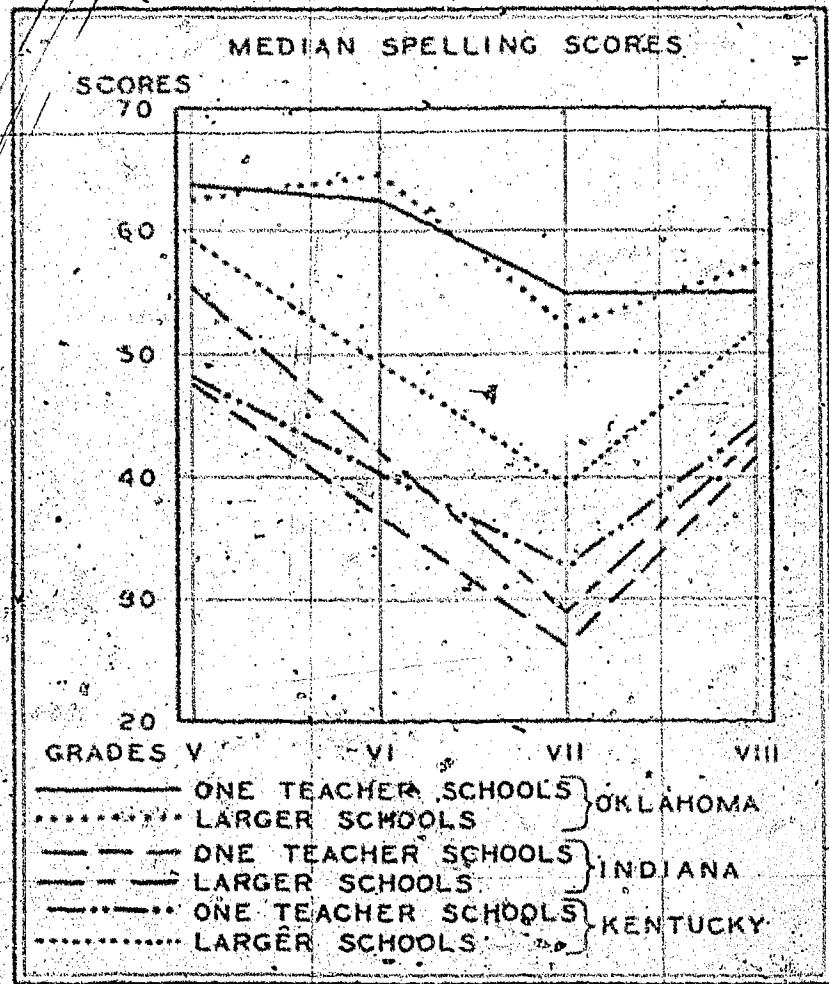


TABLE 9.—Median spelling scores in Wisconsin

Test used	Type of school	Median by grade						Number of pupils tested
		III	IV	V	VI	VII	VIII	
Iowa Word List	One teacher	40.7	36.9	32.6	28.6	24.3	20.3	1,381
	Larger	44.1	43.6	36.0	32.8	27.8	23.9	1,234
Ayer's Spelling Scale	One teacher	36.0	39.0	36.9	31.6	26.9	23.0	1,382
Morrison-McCall Spelling Scale	One teacher	34.0	38.0	39.0	31.0	26.0	23.0	1,383
	Larger	31.0	36.9	31.0	30.3	23.8	20.7	141
	Larger	37.5	32.2	30.2	32.7	32.0	30.1	242

The scores included are those of pupils in one-teacher and larger schools in grades 3 to 8, inclusive, in each of three different tests, arranged by grades and schools for the purpose of comparison. The number of pupils examined on each test in each type of school is also shown.

In 15 of the 18 comparisons shown in Table 9 higher median scores were made by pupils in the large-type schools than by those in the small schools; in 2 comparisons, the seventh grade on the Iowa Word List and the fifth grade on the Ayers Spelling Scale, the opposite is true. In one case, the third grade on the Ayers Spelling Scale, the scores are equal. The results of the first two tests are probably of more significance than those of the last one, due to the fact that greater numbers of pupils were examined in the first two tests. While the differences shown in the comparisons are not striking, the consistency with which the higher scores appear for pupils in the large-type schools of Wisconsin indicates that pupils learn to spell better in them, grade for grade, than they do in the one-teacher schools of the State.

*Spelling scores of pupils in Spokane County, Wash.*—A comparison of the spelling scores made by pupils in a survey of the one-room and the village graded schools of Spokane County, Wash., shows that the pupils in the large-type schools were 2.7 per cent more efficient in spelling than those in the surrounding one-room schools. The greatest difference appeared between scores of pupils in the seventh grade. Although this difference between the two groups of pupils is not great, it is significant, since the pupils were paired on the basis of intelligence test scores and chronological ages. The comment is made in the report of the survey that the graded-school pupils were approximately one-half school year in advance of pupils in the surrounding one-room schools with whom they were paired.

#### WRITING ABILITIES OF PUPILS

A number of typical comparisons of median scores on handwriting in the two types of rural schools under discussion are presented here. They show the relative achievement of pupils in various elementary grades of rural schools in different sections of the country.

Table 10.—Median handwriting scores in four States

State	Examination	School	Scores by grades					
			III	IV	V	VI	VII	VIII
Kansas	Ayers Scale	One-room	21.5	26.1	29.2	34.6	38.1	39.8
		Large	28.1	31.6	33.1	36.3	38.8	39.7
Oklahoma	Iowa Test	One-room	28.8	33.0	32.3	30.4	33.0	37.0
		Large	31.1	34.4	37.1	36.9	42.6	45.1
West Virginia	do	One-room	25.0	33.1	35.5	39.3	46.0	52.3
		Large	30.4	31.6	34.2	36.9	38.1	41.6
Wisconsin	Thomotile Scale	One-room	7.5	8.6	9.1	9.5	10.7	11.7
		Large	7.8	8.2	9.0	9.5	9.3	10.7

Table 10 gives the median handwriting scores of pupils in grades 3 to 8, inclusive, of one-teacher and of large rural schools in the States named. The scores indicate the quality of writing and are arranged to compare this ability of pupils, grade for grade, in the two types of schools in the respective States.

Higher scores were made by third, fourth, fifth, sixth, and seventh grade pupils in the large rural schools in Kansas, by third, fourth, and sixth grade pupils in Oklahoma, and by third and fifth grade pupils in West Virginia than by those of the corresponding grades in the one-teacher schools of the respective States. The median sixth-grade score was the same for pupils in the large and in the one-teacher schools of Wisconsin, while in all other comparisons higher median scores were made by pupils in the one-teacher schools than by those of the corresponding grades of the large rural schools.

Pupils of the one-teacher schools scored higher in 13 of the 24 comparisons shown and lower in 10 than those of the large rural schools. In one comparison the scores were equal. In some instances the differences are significant, while in others there is little apparent difference between the quality of handwriting of the comparable groups of pupils. Of most significance are the median scores made in the large rural schools of Kansas, which indicate that the pupils in these schools were more than a school grade ahead of those in the one-teacher schools of that State. In Wisconsin higher scores appear regularly for pupils of the various grades of the one-teacher schools than for those of the large-type school, but the difference in no case is great.

#### COMPARISONS OF TEACHING RESULTS IN CERTAIN CONTENT AND OTHER SUBJECTS

In discussing the educational output of the schools, survey reports attach much importance to the results of tests which measure pupils' ability to read understandingly about problems of effective citizenship. A number of the reports contain results of tests that indicate the extent of attainment of pupils in the social sciences and other content subjects, some of which permit comparison between the attainment of pupils in these subjects in the two types of rural schools under discussion. Some typical results are presented here.

TABLE 11.—Median history scores in three States

State	Type of school	Scores by grade on—			
		Information questions		Thought questions	
		Seventh	Eighth	Seventh	Eighth
Iowa	One-teacher	9.1	10.1	9.7	11.6
	Large	9.3	11.1	11.1	12.8
Kentucky	One-teacher	3.9	3.7	3.8	6.8
	Large	19.4	15.5	17.0	19.3
New York	One-teacher	—	37.6	—	39.0
	Total	—	39.0	—	37.0

Table 11 shows the median history scores made in one-teacher and in large rural schools by seventh and eighth grade pupils in Indiana and Kentucky and in the eighth grade in New York State. The questions were selected from the Van Wagenen History Scales to test pupils on information and thought. Pupils in Indiana were tested during the second half of the year those in Kentucky during the first half. Schools designated as "large" in Indiana and Kentucky employed six or more teachers each; those in New York employed four teachers each.

In every comparison it is seen that pupils of large rural schools scored higher on history questions, both informational and thought, than those of the corresponding grades of the one-teacher schools. The greatest difference occurs between the scores of pupils in the two types of schools in Kentucky. The comparisons indicate more

consistency between the two groups of pupils, grade for grade, in history ability. Of the results made in New York the report states:

The foundation of a genuine Americanization is a knowledge of American history, and the basis for acquiring this knowledge is an adequate mastery of the language in which that history is recorded. Judged by the degree to which their pupils have this knowledge and mastery, the rural schools of New York are distinctly and clearly deficient and the smaller schools most deficient of all.

*A comparison of geography scores of rural pupils.* Geography scores of 2,311 pupils in consolidated schools and of 1,435 pupils in one and two teacher schools of Ohio are shown in the report of a state-wide testing program in that State, in which the Buckingham-Stevenson Place Geography Tests were used.

Median scores of pupils in the consolidated schools on world geography questions were: Fifth grade 12.3, sixth grade 23.7, seventh grade 37.6, and eighth grade 40; corresponding scores in one and two teacher schools were 4.1, 11.2, 26.8, and 35.3. The differences in favor of the consolidated schools were 8.2, 12.5, 10.8, and 4.7 points for the respective grades. Median scores of pupils in the consolidated schools on United States geography questions were: Fifth grade 9.9, sixth grade 16.6, seventh grade 23.3, and eighth grade 28.3; corresponding scores in one and two teacher schools were 6.7, 11.2, 20.8, and 30.2. The differences in favor of the consolidated schools were 3.2 points for the fifth grade, 5.1 for the sixth grade, and 2.5 for the seventh grade, while the difference was 1.9 points in favor of the small-type schools in the eighth grade.

*Composition scores of pupils in rural schools.* In the state-wide survey of instruction in elementary schools of Kansas 1,232 pupils

<sup>a</sup> Rural school survey of New York State. Educational achievement, p. 186.

<sup>b</sup> Whitmer, L. W. A comparison of consolidated and one-teacher schools based upon results obtained on the Buckingham-Stevenson Place Geography Tests. State University, Columbus, Ohio. Educational Research Bulletin, vol. 3, pp. 6-53 January, 1923.

were tested on the Willing Language Scale in one-teacher schools and 932 in rural village schools. Higher testing scores were made by pupils in each of six grades, 3 to 8, inclusive, in the large-type schools than by those of the corresponding grades in the one-teacher schools of the State.<sup>7</sup> The difference in favor of the larger schools varied from 5 per cent in the third grade to 12 per cent in the sixth grade. The seventh-grade pupils in the large-type schools averaged as high as eighth-grade pupils in the one-teacher schools.<sup>8</sup>

*Ability in English of pupils entering high schools.*—  
*Rural schools.*—A number of studies have been made to determine whether pupils entering the eighth grade from one-teacher schools were as well prepared for high-school work as those from rural village schools. Results of standardized tests given pupils in each of the two groups, soon after entering high schools, or class records in first or second year high-school courses, have been compared. Results reported on English tests and class records of pupils in small high schools in Illinois, Iowa, and the State of Washington are typical of those available.

A recent investigation<sup>9</sup> of high-school records of pupils in Illinois shows that pupils trained in town schools averaged 1.34 per cent higher in all high-school subjects and 1.71 per cent higher in English than pupils from the one-teacher schools. Results of a study<sup>10</sup> made in Iowa, using the Briggs English Form Test, the Kirby Grammar Test, and the Willing Composition Scale, given the last month in eight high schools, show that fewer errors were made by pupils from village elementary schools in the use of capitals, question marks, completion sentences, commas before "but," correct English in sentences, correctly spelled words, and application of the rules of grammar in sentences, but more errors in the use of terminal periods and the apostrophe of possession than by those from the surrounding one-teacher schools. Scores<sup>11</sup> on Briggs English Form Test, given to ninth-grade pupils from one-teacher schools and to an equal number from graded village schools in Spokane County, Wash., indicate an average difference in ability between the two groups of pupils equal to 4.9 months of school work in favor of those from the graded schools.

*Typical statements.*—The following statements concerning the teaching of appreciation, content, and other subjects in rural schools are contained in various survey reports:

If a child is obliged to attend a one-teacher school, he is for the most part denied opportunity for work in music and other fine arts and in the household and industrial arts. His elementary school life is limited almost entirely to the

<sup>7</sup> Illinois State Teachers' Association, High-school records of rural graded and ungraded schools, Illinois State Teachers' Association, Springfield, Ill., Report and Department, 1921.

<sup>8</sup> McFarland, W. H., "English ability of town and rural pupils," Report of Iowa, Iowa City, Iowa, 1920, Chapter 7.

<sup>9</sup> Sigma, C. W., and Curtis, J. W., "Progress of segmented one-room and graded school pupils," Journal of Educational Research, 10, 256-261.

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drudgery of learning the simple fundamentals. In those subjects, in which he may be expected to make his best showing, work is practically limited to class, he falls far behind the educational goal of his elementary school. *Publication in Education*, 3, No. 2, 1927.

These figures, higher median asphalt than the consolidated school than for the corresponding grades in the five different combinations of the two schools, are not necessarily indicative of lack of teaching ability in the one-teacher rural schools, but rather show the inadequacy of the present system, for it is handicapped by the lack of time and the inadequacy of equipment. *Results of a testing survey of the Steinberg consolidated and adjacent one-room schools*. State University, Columbus, Ohio. *Educational Research Bulletin*, volume 4, February, 1927.

Pupils of the Cahuilla Consolidated School averaged from 11 per cent more efficient in the eighth grade to 20 per cent more in the sixth grade than those of the corresponding grades of the 12 surrounding one-teacher schools. In case of reading, scores varying from 10 to 30 per cent higher were made in the different grades of the consolidated school than in those of the one-teacher schools. As in reading comprehension, the smallest difference was in the upper grades. Pupils in these two (upper) grades possibly may have received much the same type of training in their earlier school life, or many of the less efficient pupils in the rural schools drop out of school before those grades are reached. *State Teachers College, Results of teaching in one-room rural schools compared with results in consolidated schools*. Color Falls, Iowa. (Micrographed).

In April, 1927, the Woody-McCall Mixed Fundamentals, Form III, was given to all eighth-grade pupils—514 city (village) 615 rural (one-teacher and larger rural schools)—in Tulare County, Calif. The city median was 30.39, and the rural median 31.28.

At the same time the Woody-McCall, Form III, was given we also gave standard tests in language, geography, United States history, and literature. The possible score in these tests was 63. The city median was 30.19 and the rural median 33.03.

You will note the surprising fact that the rural median was several points above the city median. This we attribute to the system of rural supervision that has been practiced in this county for the past three or four years. It shows conclusively that the county school properly supervised is a mighty fine institution. *Burkman, J. R. (county superintendent). Results of a county-wide testing program*. Visalia, Calif., 1927. (Unpublished report).

Even in a very few cases where the use of the technique of individual instruction seems to have solved the problem so far as a mastery of the subject matter is concerned in the small isolated school, there is always lacking the other and more important phase of secondary education, namely, training in the theory and practice of the social sciences. Actual large group contacts in citizenship and extra-curricular activities are necessary for the adequate preparation of young citizens for the larger group life of adulthood. *Whitney, F. L. High-school opportunities in Colorado*. State Teachers College, Greeley, Colo. *Research Bulletin*, No. 12, August, 1927.

The general low standing of the one-teacher schools is not confined to the subjects tested. We must not forget that the one-teacher schools are also at a disadvantage in facilities to attain some of the other important outcomes which we have not tested. Among these may be brief breadth of reading; skill in the use of reference books; ability to, and enjoyment of, music and art; and learning

of mathematics and English by comparing with others. Better showing was made on the tests in English and geography than in language tests than in the fundamental subjects. (Clark County Commissioners, An educational survey of school districts of 16, 18, 20, 22, and 24 of Clark County, Colo., Delta, County Superintendent, 1921.)

### SUMMARIES AND CONCLUSIONS

In the preceding pages typical comparisons have been shown between the achievement of pupils trained in one-teacher schools and those trained in large rural schools, covering a number of elementary school subjects. The tabulation of data has been arranged mainly by subjects. In Table 12 and the following pages a summarization is given of the results of testing programs appearing in eight State survey reports showing the comparative ability of pupils in the two types of rural schools by States, and for the group of States, in reading, arithmetic, and spelling.

Table 12.—Comparisons of median scores of pupils in large and in small rural schools in eight States

Number of schools and pupils tested	Number of schools in which higher percentages of pupils were achieved		Percent of schools in which higher percentages of pupils were achieved	
	Large schools	Small schools	Large schools	Small schools
<b>Reading</b>				
Alabama	10	10	33.3	33.3
Kansas	10	10	33.3	33.3
Michigan	10	10	33.3	33.3
Mississippi	10	10	33.3	33.3
North Carolina	10	10	33.3	33.3
Tennessee	10	10	33.3	33.3
West Virginia	10	10	33.3	33.3
Total	10	10	33.3	33.3
<b>Arithmetic</b>				
Alabama	10	10	33.3	33.3
Kansas	10	10	33.3	33.3
Michigan	10	10	33.3	33.3
Mississippi	10	10	33.3	33.3
North Carolina	10	10	33.3	33.3
Tennessee	10	10	33.3	33.3
West Virginia	10	10	33.3	33.3
Total	10	10	33.3	33.3
<b>Spelling</b>				
Alabama	10	10	33.3	33.3
Kansas	10	10	33.3	33.3
Michigan	10	10	33.3	33.3
Mississippi	10	10	33.3	33.3
North Carolina	10	10	33.3	33.3
Tennessee	10	10	33.3	33.3
West Virginia	10	10	33.3	33.3
Total	10	10	33.3	33.3

\*Comparisons between pupil scores in these types of schools in Kansas in arithmetic, the median scores in 1 case were equal.

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There is much evidence of pupils' activities in fields of other subjects which is reflected in the following comparisons of pupils in one-teacher schools with pupils in large rural schools in the same state. In 1912, Oklahoma pupils in one-teacher schools with grade equivalents between 5 and 8 had median scores 10 per cent higher than those in large rural schools; New York, 10 per cent lower; California, 10 per cent higher; Oregon, 2,312; Oklahoma, 1,132; Pennsylvania, 2,725; Florida, 1,000; Colorado, 1,000; Texas, 1,000; Kansas, 1,000; West Virginia, 1,000; probably 10 per cent higher in one-teacher schools than in large rural schools.

From 1912 it can follow from the Indiana Bureau's report that there was no significant difference in the reading writing abilities of pupils in large rural schools and of those in one-teacher schools in one-teacher schools, excepting arithmetic. In each of these, higher scores were made by pupils of the larger schools, which amounts to 10 per cent of the Indiana comparisons while hardly less than the 10 per cent in similar manner regard writing, the range for results in each being the same, subject and for the total number of each subject.

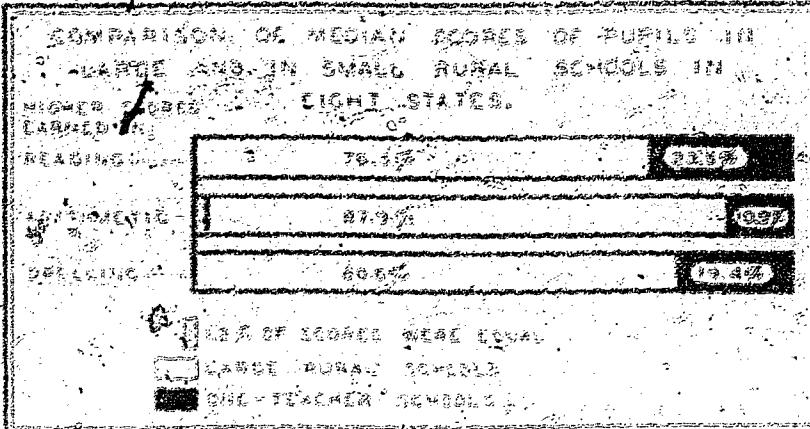
It can be seen from Table 12 that pupils in large rural schools made higher reading writing scores in 31 of the 33 comparisons and lower in 12 than others of the corresponding grades in one-teacher schools. The ratios of percentages of one-teacher schools were higher in 20 of 33 comparisons. The median scores were higher in 20 of 33 comparisons. The total number of the total number of comparisons made.

In 1912 it can be seen that pupils in large rural schools made higher reading writing scores in 16 of the 17 comparisons and lower in 1 of the 17 than others of the corresponding grades in one-teacher schools. The ratios of percentages of one-teacher schools were higher in 10 of 17 comparisons. The median scores were higher in 10 of 17, above 10 per cent, lower median scores (in 10 comparisons they were equal) for pupils in large rural schools, than for those for those in the one-teacher schools. In a total of 11 comparisons of writing ability 35, or 30.0 per cent, show higher, and 30, or 27.3 per cent, lower median scores for pupils in the large schools, while the greater, than for those in the one-teacher schools.

Of the 8 State Survey reports, 6 show that all comparable medium reading, arithmetic, and writing scores were uniformly higher in large than in one-teacher rural schools. In 2, the Oklahoma and the West Virginia studies, however, were higher in one-teacher schools. In Oklahoma the medium scores were higher in 4 of a total of 8 comparisons for reading, in 5 of a total of 11 comparisons in arithmetic, and in 2 of a total of 8 comparisons in writing, for pupils in one-teacher schools than for those in the corresponding grades of large rural schools. In West Virginia the median scores were higher in 8 of a

total of 2,000,000 pupils are reading. This is a total of 2,000,000 in large cities, 1,000,000 in small towns and in rural schools. In writing the pupils in large cities are 1,000,000 more than the others for those of the participating groups and larger rural schools.

Other data show that writing tests were given to larger percentages of pupils than reading, though almost the reverse was true in 1915. Large cities provided 3,000,000 additional tests and rural schools 2,000,000 additional tests. The percentages of tests in reading were 1,000,000 more than in writing in 1915, while in 1916 they were 1,000,000 less. The figures for 1915 show that 1,000,000 more tests were given in the large cities than in the rural schools, and 1,000,000 more tests were given in the rural schools than in the small towns. The figures for 1916 show that 1,000,000 more tests were given in the large cities than in the rural schools, and 1,000,000 more tests were given in the small towns than in the rural schools.



Comparing the data in Table 12 graphically, Figure 3 is presented. The comparative distribution of reading, reading, arithmetic, grammar and spelling scores shown in the table are represented by the component parts of the graphs.

The upper bar of Figure 3 represents all or part of the comparative study between reading abilities of pupils in the two types of schools in the eight States; the right portion represents the per cent of higher reading scores earned in the large rural school; the shaded portion, that earned in the small type. Similarly the middle bar represents comparison in arithmetic abilities; the bottom portion of this bar shows the per cent of scores which were equal grade for grade in the two types of schools.

The results of a majority of writers, a few of whom have been reviewed herein indicate that pupils taught in large rural schools

acquire a better mastery of the fundamentals of learning. Students in grade three those trained in one teacher schools, a few teachers show the opposite, while the results of at least one extensive study, although showing higher scores for pupils of large rural schools than for those of small ones, when converted into achievement quotients, indicate greater effectiveness in the small type school.

The rural school administrator will want to know the causes of these conditions. It may be better classification and teaching; longer school, better building, better location of the larger schools, more of the small ones, or other, incalculable factors. Results should be studied in the light of all available data. Continued study and additional investigation, which will permit wider comparison and more detailed conclusions on the educational results in the two types of rural schools, are needed.

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